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Apple Built-In Ethernet 1.01: Fix For MACE Controller (12/95)

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Security:       Everyone


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TOPIC -------------------------------------------------------------

Macintosh Quadra 660AV, 840AV, Power Macintosh, and PowerPC-based Workgroup
Server computers may freeze and/or have data corruption problems related with
the MACE Ethernet controller. This article describes a fix and where to locate
the software needed.


DISCUSSION --------------------------------------------------------

The Network Software Installer (NSI) 1.5 contains the Apple Built-In Ethernet
driver file version 1.0.1. This driver file contains drivers for all Apple
built-in Ethernet implementations and is installed in the extensions folder.

The Macintosh Quadra 660AV and 840AV, Power Macintosh 6100/60, 6100/66, 7100/66,
and 8100/80, and Workgroup Server 6150, 8150, and 9150 Ethernet drivers were
updated to eliminate slowdowns, hangs, lost connections, and data corruptions
that were possible on some Ethernet networks. Installing NSI 1.5 fixes this
problem.

If you do not have access to NSI 1.5 follow the instructions below:

Hardware Products Affected
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Macintosh Quadra 660AV, 840AV
Power Macintosh 6100/60, 7100/66, 8100/80
Power Macintosh 6100/66
Apple Workgroup Server 6150, 8150, and 9150
Fixed in the ROM of the 7100/80, 8100/100, and 8100/110

NOTE: The MACE patch is NOT included in the Power Macintosh 6100/66 computer.
The patch is present in the 7100/80, 8100/100, and 8100/110 ROM, but the 6100/66
computer does not have this ROM. Therefore it does not have the MACE patch.
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Software Versions Affected

Ethernet driver that ships with:

• System 7.1 (840AV/660AV) Ethernet (.ENET) driver version 1.0.1
• System 7.1.2, Ethernet (.ENET) driver version 1.0f2d4
• System 7.5, Ethernet (.ENET) driver version 1.0f2d4
• Workgroup Server 9150, System Software 7.1.2, Ethernet (.ENET) driver version
1.0.1b1q4

Software Version(s) Required to Resolve the Problem

• Drag install-able driver (Apple Built-In Ethernet) version 1.0f1 which
includes:

- Macintosh 660AV, Macintosh 840AV Ethernet (.ENET) driver version 1.0f2d4

- All Power Macintosh and Workgroup Server products Ethernet (.ENET) driver
version 1.0f2d4

• Network Software Installer 1.4.5.

Problem Description

A problem exists in the MACE Ethernet controller chip used in the Macintosh
products listed above. In some situations the MACE Ethernet controller chip can
get into a condition that causes the operating system to hang, data corruption,
or a system crash. The fundamental cause of the problem is an error condition
known as a late collision. A late collision is defined as a collision that
occurs after the initial, and normal, 64 byte collision window (preamble and
start frame delimiter not included). Late collisions are usually the result of a
network whose physical extent exceeds the maximum round trip delay as specified
by the 802.3 specification. This can be caused by either a network segment that
is too long, or from a network design that exceeds the maximum number of
allowable repeaters.

Macintosh 840AV, 660AV, and Power Macintosh 6100/60, 7100/66, and 8100/80
systems will typically see this problem manifest itself as a system hang. The
problem usually occurs when transferring data from the Macintosh to a remote
device (File Server, Mail Server, and so on). The Macintosh appears to be
frozen, the mouse can still be moved but no menu items can be selected. In some
situations the Macintosh may not freeze but may corrupt the data in the packet
being transmitted when the late collision occurred. The corrupt data actually
looks like valid data and is accepted by the destination device. As such this
problem can cause corrupt files to be stored on File Servers or other remote
devices. Any of the Power Macintosh computers running AppleShare 4.0.2 or any of
the PowerPC-based Workgroup Server products, would usually crash with an
unimplemented instruction error when they encountered this condition.

There is no loss of performance in using these new drivers other than the time
required for the driver to retransmit the packet after the error condition is
encountered. The time required to retransmit the packet is no more than a few
microseconds. The packet is retransmitted at the driver level instead of by a

higher level protocol allowing the data transfer to continue without degrading the performance of the transfer.

Please do not install these drivers on any Macintosh other than those listed above. There is no benefit and the installation of the extensions based drivers has only been tested on the affected system configurations.

Installation Details with NSI 1.4.5

The new Built-In Ethernet drivers are installed as an extension instead of as an integral piece of the "System" file. To install the extensions based version of the Built-In Apple Ethernet drivers please follow the instructions below exactly. Even if you have done a install of NSI 1.4.5 previously, it is important to follow the steps provided below.

You might be wondering why you have to install NSI 1.4.5, again? For that matter why do would you need to select Twisted-Pair Ethernet when you're using the AAUI interface? In answer, this is the first time that Apple has distributed a network driver as an extension. As such, an obscure problem was discovered that caused the NSI installer to not update a piece of software that is now needed to load drivers from the extension folder. Because this code was never required before the release of these new drivers this was never a problem. By following the instructions below you will install an updated piece of code that will allow the extensions based drivers to load. If you do NOT follow the instructions, the extensions based drivers WILL NOT load.

You should install NSI 1.5 when it becomes available as it will remove all old Ethernet drivers from the System and install the latest versions of AppleTalk and the "Apple Built-In Ethernet" driver file. With the release of NSI 1.5, all Ethernet drivers will reside in the "Apple Built-In Ethernet" extensions file instead of in the "System" file.

Installation Instructions with NSI 1.4.5

Step 1
Run the NSI 1.4.5 Installer and choose "Custom" install.

Step 2
Choose "AppleTalk v.58.1.4 for System 7" and "EtherTalk for Ethernet NB Twisted-Pair Card". Click "Install" to install the drivers. The installer then forces a restart.

Step 3
Drag the "Apple Built-In Ethernet" file onto the System folder.

Step 4
Reboot the system.

These articles can help you locate the NSI 1.4.5, NSI 1.5, and Apple Built-In Ethernet software mentioned here:

• "Where To Find Apple Software Updates" -- Lists online services for free Apple software updates.

• "Obtaining Apple Product Support in the USA" -- Lists 800 numbers and online services for software updates, Apple support information, and a subset of the Apple Tech Info Library.

You can verify that the new drivers are loaded by observing the extension icons displayed at boot time. After installing the new driver you should see the Built-In Apple Ethernet" icon (same icon as is associated with the "Apple Built-In Ethernet" drivers file you did the drag install on) when the system is loading.

Article Change History:
21 Dec 1995 - Corrected typographical mistake.
14 Mar 1995 - Updated article with NSI 1.5 information.
15 Feb 1995 - Added information on the 6100/66, 7100/80, and 8100/100.

Support Information Services

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